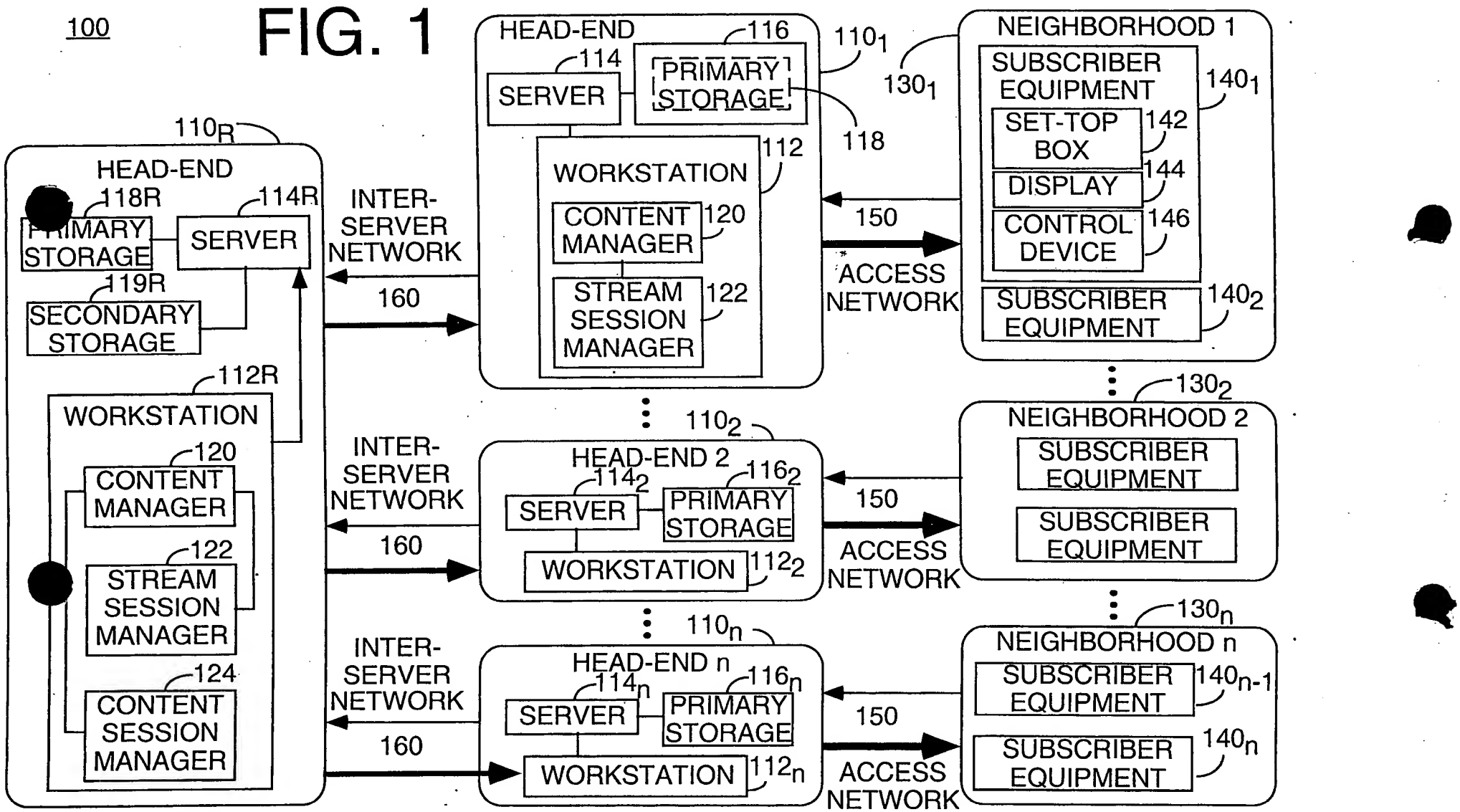
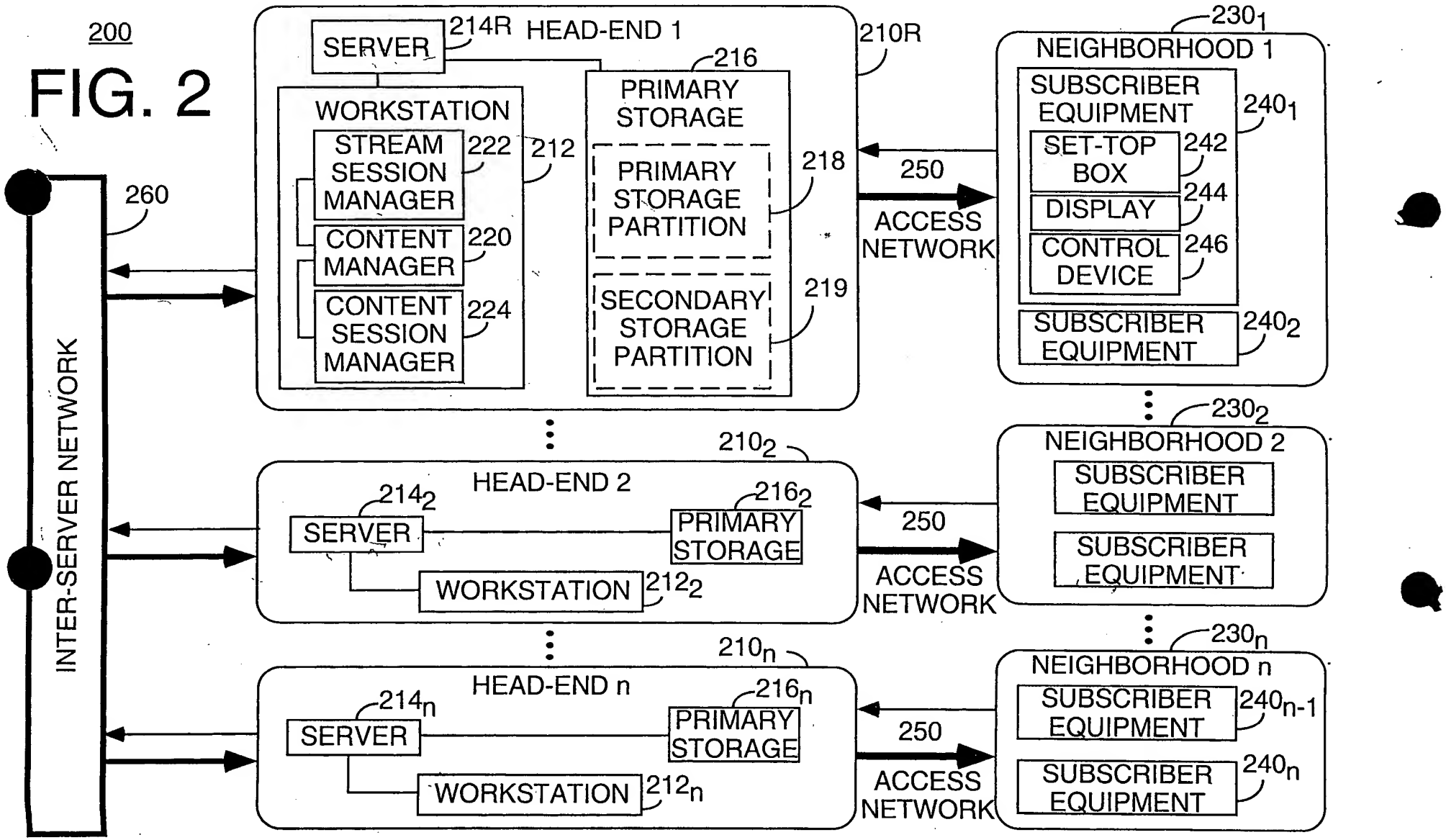

100
FIG. 1
HEAD-END
116
114
SERVER
PRIMARY STORAGE
118
112
WORKSTATION
CONTENT MANAGER
120
STREAM SESSION MANAGER
122
110_1
130_1
NEIGHBORHOOD 1
SUBSCRIBER EQUIPMENT
140_1
SET-TOP BOX
142
DISPLAY
144
CONTROL DEVICE
146
SUBSCRIBER EQUIPMENT
140_2
110_R
HEAD-END
118R
PRIMARY STORAGE
114R
SERVER
119R
SECONDARY STORAGE
112R
WORKSTATION
120
CONTENT MANAGER
122
STREAM SESSION MANAGER
124
CONTENT SESSION MANAGER
INTER-SERVER NETWORK
160
150
ACCESS NETWORK
110_2
HEAD-END 2
114_2
SERVER
116_2
PRIMARY STORAGE
112_2
WORKSTATION
130_2
NEIGHBORHOOD 2
SUBSCRIBER EQUIPMENT
SUBSCRIBER EQUIPMENT
110_n
HEAD-END n
114_n
SERVER
116_n
PRIMARY STORAGE
112_n
WORKSTATION
130_n
NEIGHBORHOOD n
SUBSCRIBER EQUIPMENT
140_{n-1}
SUBSCRIBER EQUIPMENT
140_n

200

FIG. 2



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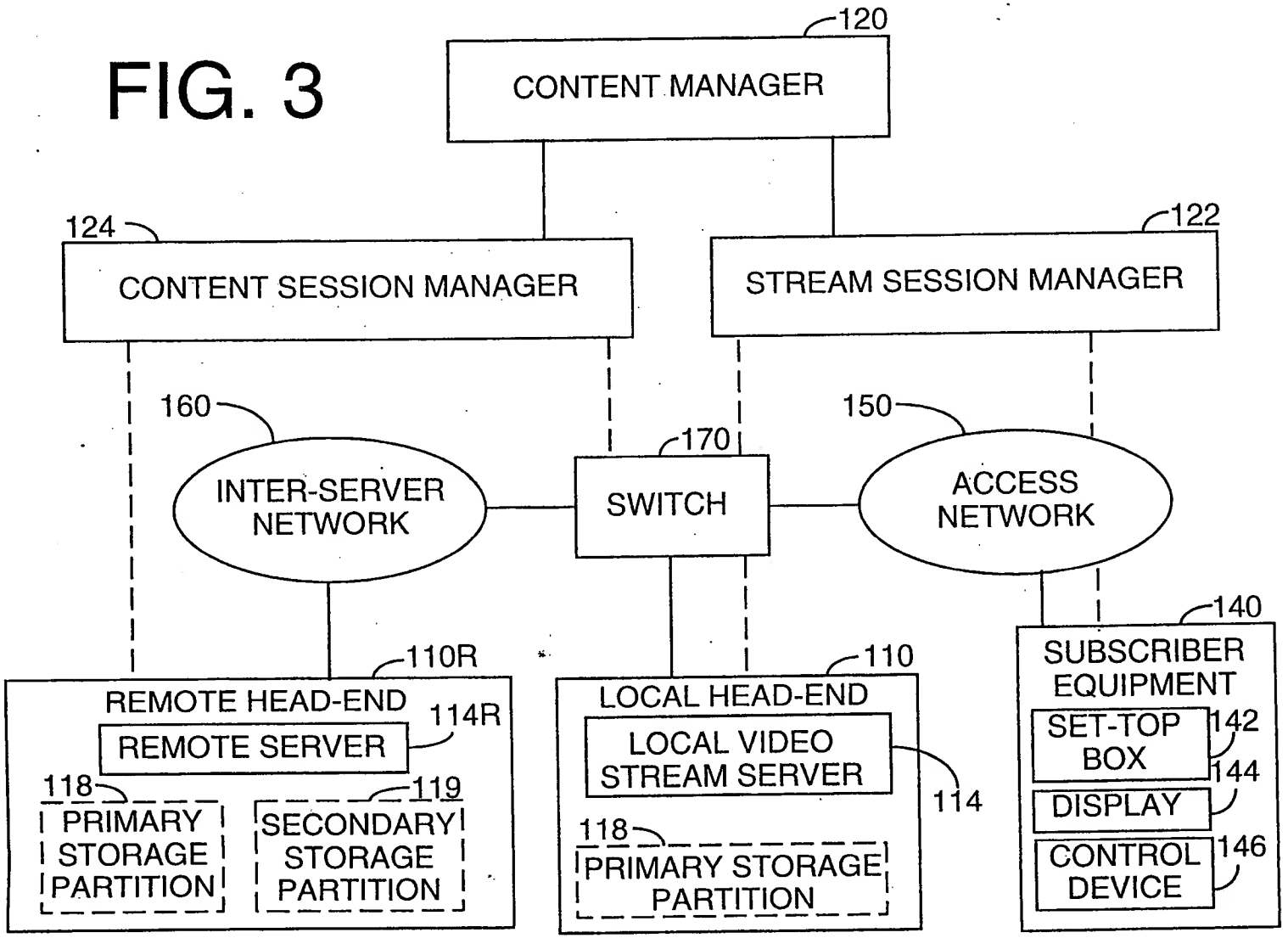
100

FIG. 3


120
CONTENT MANAGER
124
CONTENT SESSION MANAGER
122
STREAM SESSION MANAGER
160
INTER-SERVER NETWORK
170
SWITCH
150
ACCESS NETWORK
140
SUBSCRIBER EQUIPMENT
SET-TOP BOX
142
DISPLAY
144
CONTROL DEVICE
146
110R
REMOTE HEAD-END
114R
REMOTE SERVER
118
PRIMARY STORAGE PARTITION
119
SECONDARY STORAGE PARTITION
110
LOCAL HEAD-END
LOCAL VIDEO STREAM SERVER
114
118
PRIMARY STORAGE PARTITION

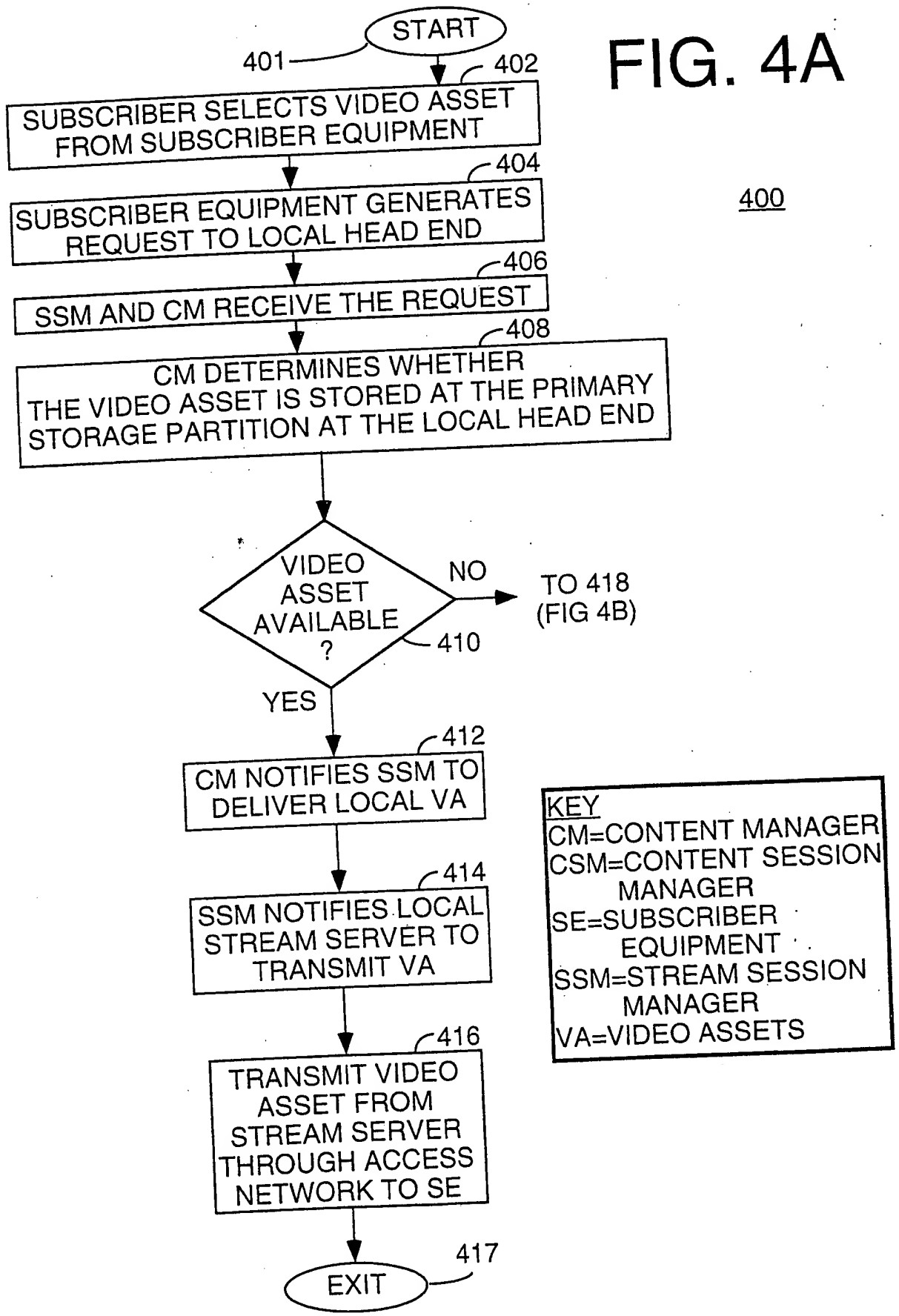

START
401
402
SUBSCRIBER SELECTS VIDEO ASSET FROM SUBSCRIBER EQUIPMENT
404
SUBSCRIBER EQUIPMENT GENERATES REQUEST TO LOCAL HEAD END
406
SSM AND CM RECEIVE THE REQUEST
408
CM DETERMINES WHETHER THE VIDEO ASSET IS STORED AT THE PRIMARY STORAGE PARTITION AT THE LOCAL HEAD END
VIDEO ASSET AVAILABLE ?
410
NO
TO 418 (FIG 4B)
YES
412
CM NOTIFIES SSM TO DELIVER LOCAL VA
414
SSM NOTIFIES LOCAL STREAM SERVER TO TRANSMIT VA
416
TRANSMIT VIDEO ASSET FROM STREAM SERVER THROUGH ACCESS NETWORK TO SE
417
EXIT
KEY
CM=CONTENT MANAGER
CSM=CONTENT SESSION MANAGER
SE=SUBSCRIBER EQUIPMENT
SSM=STREAM SESSION MANAGER
VA=VIDEO ASSETS

FIG. 4A

400

FIG. 4B

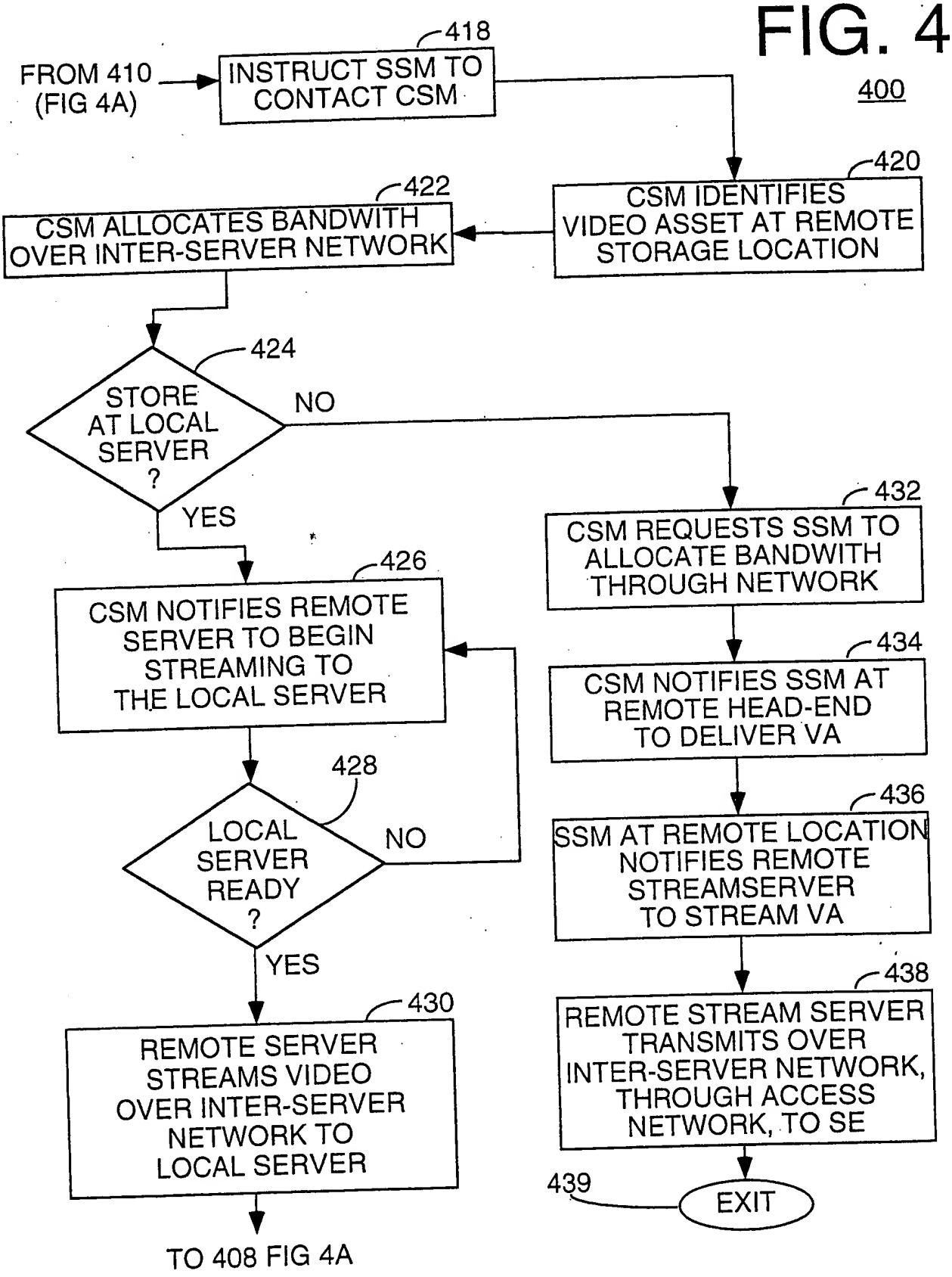
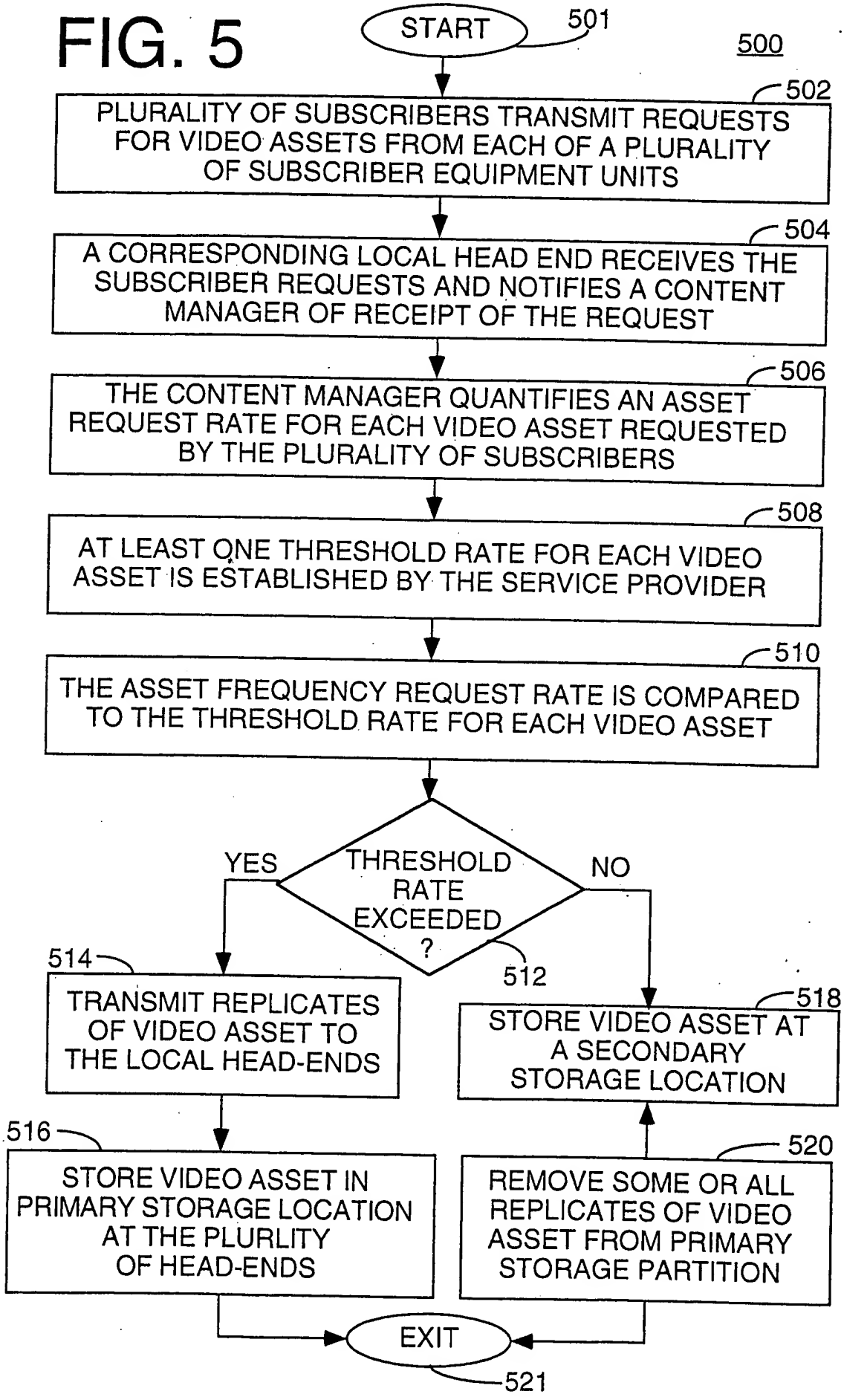

400
FROM 410 (FIG 4A)
418
INSTRUCT SSM TO CONTACT CSM
420
CSM IDENTIFIES VIDEO ASSET AT REMOTE STORAGE LOCATION
422
CSM ALLOCATES BANDWITH OVER INTER-SERVER NETWORK
424
STORE AT LOCAL SERVER ?
NO
YES
426
CSM NOTIFIES REMOTE SERVER TO BEGIN STREAMING TO THE LOCAL SERVER
428
LOCAL SERVER READY ?
NO
YES
430
REMOTE SERVER STREAMS VIDEO OVER INTER-SERVER NETWORK TO LOCAL SERVER
TO 408 FIG 4A
432
CSM REQUESTS SSM TO ALLOCATE BANDWITH THROUGH NETWORK
434
CSM NOTIFIES SSM AT REMOTE HEAD-END TO DELIVER VA
436
SSM AT REMOTE LOCATION NOTIFIES REMOTE STREAMSERVER TO STREAM VA
438
REMOTE STREAM SERVER TRANSMITS OVER INTER-SERVER NETWORK, THROUGH ACCESS NETWORK, TO SE
439
EXIT

FIG. 5


START
501
500
502
PLURALITY OF SUBSCRIBERS TRANSMIT REQUESTS FOR VIDEO ASSETS FROM EACH OF A PLURALITY OF SUBSCRIBER EQUIPMENT UNITS
504
A CORRESPONDING LOCAL HEAD END RECEIVES THE SUBSCRIBER REQUESTS AND NOTIFIES A CONTENT MANAGER OF RECEIPT OF THE REQUEST
506
THE CONTENT MANAGER QUANTIFIES AN ASSET REQUEST RATE FOR EACH VIDEO ASSET REQUESTED BY THE PLURALITY OF SUBSCRIBERS
508
AT LEAST ONE THRESHOLD RATE FOR EACH VIDEO ASSET IS ESTABLISHED BY THE SERVICE PROVIDER
510
THE ASSET FREQUENCY REQUEST RATE IS COMPARED TO THE THRESHOLD RATE FOR EACH VIDEO ASSET
THRESHOLD RATE EXCEEDED ?
512
YES
NO
514
TRANSMIT REPLICATES OF VIDEO ASSET TO THE LOCAL HEAD-ENDS
516
STORE VIDEO ASSET IN PRIMARY STORAGE LOCATION AT THE PLURLITY OF HEAD-ENDS
518
STORE VIDEO ASSET AT A SECONDARY STORAGE LOCATION
520
REMOVE SOME OR ALL REPLICATES OF VIDEO ASSET FROM PRIMARY STORAGE PARTITION
EXIT
521